A6825A & A6847A PCI 1000 Base-T and 1000 Base-SX Installation Guide

HP-UX & OpenVMS Networking

Manufacturing Part Number: 5971-4263
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Localized Documentation

This Installation Guide has been translated to:

日本語 http://www.docs.hp.com/ja/index.html

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1 HP-UX Installation

This chapter provides instructions for installing the A6825A and A6847A PCI 1000Base-T and 1000Base-SX (fiber) cards on HP-UX 11i v 2.0 or later. This chapter contains the following sections:

- “Installation”
- “Network Card Configuration Worksheet”

Thank you for purchasing HP I/O Cards

If you are installing an HP I/O card as an add-in device, please review this document before attempting installation.

If an HP I/O card was factory installed in your server, you can skip to Step 7: Verify the installation section.

HP welcomes your input. Please email us at: netinfo_feedback@cup.hp.com with comments or suggestions on HP I/O Cards or related documentation.

All product documentation, including a comprehensive support guide, installation guide, release notes, as well as information on supported servers, HP-UX versions, drivers, and patches, is available online at: http://docs.hp.com

1. Click on “browse by topic”.
2. Click on “networking and communications”.
3. Click on the *1000Base-T and 1000Base-SX (Gigabit Ethernet)* product category.

Installation

These instructions apply to PCI 1000Base-T and 1000Base-SX (fiber) cards on HP-UX 11i v 2.0 or later. The Base-T cards operate at 10 or 100 Mbit/s in either full- or half-duplex modes and at 1000 Mbps only in full-duplex mode. The 1000Base-SX cards operate only at 1000 Mbps and in full-duplex mode. Ensure that your switch is set to autonegotiation or the same speed and duplex mode as this card.

For information on online addition and replacement or for advanced troubleshooting, refer to the online *Ethernet Support Guide*. The Support Guide and Release Notes are available at http://docs.hp.com and, if you have a support contract, on the Instant Information CD.

NOTE If PCI 1000Base-T is built-in, or if you have ordered factory pre-installation, you will not need to perform the following hardware and software installation steps.

Step 1: Access the system card bay

- If the system is running, shut it down by executing:

  `shutdown -h`

  Respond “**`y`**” to continue to shutdown prompt.

- Wait for the system to shutdown completely, and then power off the system by pressing the system off button. Ensure that the system is grounded.

- Open the system to gain access to the PCI backplane.
- Select an empty PCI slot and remove the slot cover.

Step 2: Install the card

- Observe the antistatic precautions.
- Record the serial number located on the card for future reference.
- Grasp the card by its edges or faceplate with both hands, insert the card into the slot, and firmly but gently press the card in until it is fully seated.
- Secure the card and reassemble the system.

Step 3: Connect the card to the network

- Attach the network cable to the card. For 1000Base-SX, cabling can be either 62.5 micron or 50 micron multimode fiber optic cable. For 1000Base-T, cabling must be Cat 5 or 5E UTP.
- Attach the free end of the cable to any unused port on the switch. Ensure power cable is connected to system. Ensure that the 1000 Mbps port on the switch is set for autonegotiation.
- If using Jumbo Ethernet frames, ensure that all end stations on a given LAN (that is, no routers or layer 3 switches in between) have the same MTU setting. However switch ports in the LAN can have any MTU setting greater than or equal to the end station MTU.
- Power up the system.

Step 4: Prepare to install the software

- Log in as **`root`**.
- Check that the `/usr/bin`, `/usr/sbin`, and `/sbin` directories are in your PATH using the command:

  ```
  echo $PATH
  ```

- The version must be B.11.23 (11i v 2.0) or later, check the HP-UX version by executing:

  ```
  uname -r
  ```

- Install the appropriate patches for your system as described in the “Required Software” section of the Release Notes, which is available on the web at http://docs.hp.com under “Networking and Communications.”

Step 5: Install the software

NOTE The GigEther-00 and GigEther-01 product software bundles are always installed as part of your operating environment. Therefore, if you have a system that has HP-UX 11i or later, *and* your networking or I/O product was either factory installed or was shipped before your system’s Operating Environment was released, you can ignore the following software installation procedure. However, you will need to install the software if you are:

- *adding* a networking or I/O card to a system *and*
- the networking or I/O card is newer than your system’s Operating Environment

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- Load the software media into the appropriate drive.
- Run the *swinstall* program to install the software using the command:

  `swinstall`
- Change the host name after "Source Host Name," if necessary.
- Click on the Source Depot Path to identify the registered depot for the appropriate source depot path and activate the **OK** button to return to the Software Selection Window.
- Highlight the 1000Base-SX/T software:
  - GigEther-00 (for cards such as A4926A and A4929A) on HP-UX 11i v 2.0, *or*
  - GigEther-01 (for cards such as A6825A and A6847A) on HP-UX 11i v 2.0. Check the Release Notes, the Support Guide, or ask your HP representative for a list of the latest cards supported.
- Choose Mark for Install from the "Actions" menu to choose the product to be installed.
- Choose Install from the "Actions" menu to begin product installation and open the Install Analysis Window.
- Activate the **OK** button in the Install Analysis Window when the Status field displays a `Ready` message.
- Activate the **YES** button at the Confirmation Window to confirm that you want to install the software. *swinstall* loads the fileset, runs the control scripts for the filesets, and builds the kernel. This should take about 3 to 5 minutes. When the status field indicates `Ready`, click **DONE**. A Note Window then opens. Activate the **OK** button to reboot the system.

Step 6: Configure the card using SAM

- Log in as **`root`** and verify that the card and its hardware path are displayed by executing:

  `ioscan`
- Run the System Administration Manager:

  `sam`
- Double-click **Networking and Communications**.
- Double-click **Networking Interface Cards**.
- Highlight the Gigabit Ethernet card and choose **Configure** from the **Actions** menu.
- Fill in the form according to the instructions using the Network Card Configuration Worksheet on page 2.
- Activate the **OK** button to activate the card and then select exit from the "File" menu until you exit SAM.

Step 7: Verify the installation

- Verify that the connector's Link LED is steady on (the card and driver are installed successfully).

NOTE On cards that have them, speed LEDs indicate not only speed but also that there is a LAN connection. The link indication will occur before data activity indication. If the card and driver have been installed, but there is no LAN connection, all speed LEDs will be OFF.

- Obtain the PPA number and the station address of each card by using the `lanscan(1M)` command.
- Verify link-level connectivity with a remote system by executing:

linkloop -i *PPA_number remote_station_address*

- Verify IP-level connectivity with a remote system by executing:

ping *Remote_IP_Address*

netstat -in

Installation is complete when you have successfully run `linkloop` and `ping`.

To configure remote systems, refer to *Installing and Administering HP-UX LAN* available on the web at http://docs.hp.com. Do this step only if remote systems have not been previously configured.

Optional Step: Configure Jumbo Frame Size (Jumbo Frames only supported at 1000 Mbit/s)

Configure Jumbo Frame Size

An optional step is to configure jumbo frame size.

NOTE Jumbo frames are only supported at 1000 Mbit/s.

Jumbo frames are in the range of 1501-9000 bytes. If using Jumbo Ethernet frames, ensure that all end stations on a given LAN (that is, no routers or layer 3 switches in between) have the same MTU setting. However switch ports in the LAN can have any MTU setting greater than or equal to the end station MTU.

Step 1. Obtain the PPA number of the card by executing:

lanscan

Step 2. Choose one of two configuration methods that will permanently save your configuration. You can either:

- Use the GUI-based system admin manager (SAM).
  To use SAM, type **sam** at the HP-UX system prompt; then double-click Networking and Communications, and then Advanced Configuration. See the *Ethernet Support Guide* for details and then do the steps for verifying the MTU size; or
- Edit the configuration file in `/etc/rc.config.d/` using an editor such as `vi`.Depending on your driver, the filename can be either `hpgelanconf`, `hpigelanconf`, or `hpietherconf`. Set the mtusize by editing either HP_GELAN_MTU[0]=*`mtusize`* , HP_IGELAN_MTU[0]=*`mtusize`*, or

  HP_IETHER_MTU[0]=*`mtusize`*, and insert the proper interface name: HP_GELAN_INTERFACE_NAME, HP_IGELAN_INTERFACE_NAME, or HP_IETHER_INTERFACE_NAME. When the system reboots, the interface will be configured for jumbo frame operation.

Step 3. Verify MTU change by executing:

netstat -rn

If MTU has not changed, execute the following commands:

ifconfig lan *PPA_number* unplumb

ifconfig lan *PPA_number ip_address* netmask *netmask* up

Step 4. To check (or verify) the current Ethernet frame size, execute:

lanadmin -m *PPA_number*

An alternative way to temporarily configure jumbo frame size is to execute the following command:

`lanadmin -M mtu_size PPA_number`

The PPA number is the one we obtained from the output of lanscan. Jumbo frames are in the range of 1501-9000 bytes.

NOTE Using `lanadmin` will not preserve your settings across reboots.

Network Card Configuration Worksheet

Fill out one worksheet for each network card you are installing.

Table 1-1 Network Card Configuration Worksheet

Data Type	Required / Optional	Default	Where to Configure	Example	Your System
Internet address	Required	0.0.0.0	SAM or ifconfig	196.6.20.2	
Subnet mask	Required if using subnetting	Subnet mask not used	SAM or ifconfig	255.255.248.0	
Station address	Built-in but can be optionally changed	As shown on card	lanadmin -A or SAM	0x0060b0c4012f	
Host name alias for this network interface (card)	Required if system is connected to more than 1 network	None	SAM	system1	
Link configuration	Required	Autonegotiating	lanadmin -X or SAM	lanadmin -X auto_on *ppa#* (if already turned off)	
Link speed/duplex mode	Required	Autonegotiating	Hub or switch[a] and lanadmin -X or SAM	lanadmin -X 100fd *ppa#*	
MTU (Maximum Transmission Unit): Jumbo Frames	Optional	1500 bytes	lanadmin -M or SAM	lanadmin -M 9000 *ppa#* [b]	
Receive flow control	Optional	On	lanadmin -X or SAM	lanadmin -X fctrl off	

a. The speed configuration of the 1000Base-T card can be 10, 100, or 1000Mbps and is determined by the speed setting of the switch port to which the card is connected. The card automatically senses this speed. The card only runs at one speed at a time. To verify the speed selection, run `lanadmin -x` *ppa#*.
b. The valid MTU range is 1024 - 9000; for Jumbo Frames, the valid MTU size is 1501 - 9000.

2 OpenVMS Installation

This chapter provides instructions for installing the A6825A and A6847A PCI 1000Base-T and 1000Base-SX (fiber) cards on OpenVMS. This chapter contains the following sections:

- “Preparing for Installation”
- “Installing the Adapter”

Thank you for purchasing HP I/O Cards

If you are installing an HP I/O card as an add-in device, please review this document before attempting installation.

If an HP I/O card was factory installed in your server, you can skip to Configure the Card Using LANCP to verify the installation.

HP welcomes your input. Please email us at: netinfo_feedback@cup.hp.com with comments or suggestions on HP I/O Cards or related documentation.

All product documentation, including a comprehensive support guide, installation guide, release notes, as well as information on supported servers, OpenVMS versions, drivers, and patches, is available online at: http://docs.hp.com

1. Click on “browse by topic”.
2. Click on “networking and communications”.
3. Click on the *1000Base-T and 1000Base-SX (Gigabit Ethernet)* product category.

NOTE Installing the adapter requires proficiency in both hardware configuration and software administration.

NOTE These instructions apply to PCI 1000Base-T (A6825A) and 1000Base-SX (A6847A) cards on HP OpenVMS V8.2 or later. 1000Base-T operates at 10, 100, and 1000 Mbps in full- and half-duplex mode. 1000Base-SX operates only at 1000 Mbps in full-duplex mode.

Preparing for Installation

Installation of an adapter requires disassembly of a few system components. Before beginning the installation, see the OpenVMS system documentation for detailed instructions on installing host bus adapters in the PCI slots.

NOTE The maximum number of Gigabit NICs you can install in any OpenVMS system is equal to the maximum number of corresponding card slots in the system. For example, if a system has four PCI card slots, you can install four Gigabit NICs in that system, assuming that all the PCI card slots are empty.

Check the latest support matrix for systems that support these adapters. The support matrix is available at http://docs.hp.com under “Networking and Communications.”

Installing the Adapter

This section contains information on installing the A6825A or A6847A adapter in an OpenVMS system.

WARNING **The installation procedures in this section require opening the computer cabinet, which might expose you to high-energy (high-amperage) circuits and sharp edges in the equipment chassis. Ensure to remove all rings, watches, and other jewelry before opening the cabinet.**

CAUTION The adapter contains electronic components that can easily be damaged by small amount of static electricity. To avoid damage, use the following guidelines:

- Store the adapter in its antistatic plastic bag until you are ready to install it.
- Work in a static-free area, if possible.
- Handle the adapter by the edges only. Do not touch electronic components or electrical traces.
- If you must lay the adapter down, place it on a non-conductive mat or surface.
- Use the ESD kit that is provided with the adapter. Follow the instructions included with the kit.
- Use a suitable ground—any exposed metal surface on the system chassis.

Before beginning the installation, and without removing the adapter from its antistatic bag, inspect the adapter for any sign of obvious damage, such as chipped or loose components. Contact Hewlett-Packard if the adapter is damaged.

Install the Card

To physically insert the card into your system, perform these steps:

1. Shut down the system.
2. Insert the card into an empty PCI slot.
3. Connect the card to the network.
4. Power up the system. When the system is up, any error messages will appear on the terminal display or system console.

See the hardware documentation for the card for details.

Boot the System

1. Log in as SYSTEM.
2. Check the OpenVMS version by executing SHOW SYSTEM. The version must be V8.2 (or later).

NOTE The LAN driver for this card is included in the OpenVMS installation.

Configure the Card Using LANCP

1. Log in as SYSTEM and verify that the card and its hardware path are displayed by executing

   MC LANCP SHOW CONFIG

   The LAN device characteristics that can be set include speed, duplex mode, flow control, and whether jumbo frames are enabled. The MC LANCP SET DEVICE and LANCP DEFINE DEVICE commands modify these settings.

2. Set the desired characteristics according to the Network Configuration worksheet (see Table 2-1). For example, use this command:

   MC LANCP DEFINE DEVICE devname /SPEED=1000 /FULL /AUTONEGOTIATE

Table 2-1 Network Card Configuration Worksheet

Data Type	Required / Optional	Default	Where to Configure	Example	Your System
Station address	Built-in but can be optionally changed	As shown on card	not configurable	0x0060b0c4012f	
Link configuration	Optional	Autonegotiating	LANCP	MC LANCP SET DEVICE/AUTO	
Link speed/duplex mode	Optional	Autonegotiating	Hub or switch[a] or LANCP	MC LANCP SET DEVICE/ SPEED=1000 /FULL	
MTU (Maximum Transmission Unit): Jumbo Frames	Optional	1518 Bytes	LANCP	MC LANCP SET DEVICE/JUMBO	
Flow control	Optional	On	LANCP	MC LANCP SET DEVICE/FLOW	

a. The speed configuration of the 1000Base-T can be 10, 100, or 1000 Mbps and is determined by the speed setting of the hub or switch port to which the card is connected. The card automatically senses this speed if autonegotiation is enabled. The card only runs at one speed at a time.

Optional Step: Jumbo Frames Size

(Jumbo Frames Size (Jumbo frames are supported only at 1000 Mbit/s)

Jumbo frames for the LAN driver on OpenVMS V8.2 have an mtu_size in the range of 1518-9018 bytes.

Jumbo frames are enabled system-wide by setting bit 6 in the system parameter LAN_FLAGS. To enable jumbo frames on individual devices, use the LANCP command SET DEVICE/JUMBO. To disable jumbo frames, use the LANCP command SET DEVICE/NOJUMBO.

To preserve the setting of jumbo frames across boots, when using LANCP, define the setting in the LANCP permanent device database, using the command DEFINE DEVICE/JUMBO.

A Regulatory Information

This appendix contains information about the card LEDs, cabling requirements, and card specifications, and regulatory statements for the United States, Canada, Australia/New Zealand, Japan, and the European community.

The Meaning of the LEDs

The Link LED indicates the card's status and must be on for the card to function properly. Note that there is no Link LED on the 1000Base-T card. In its place are three LEDs which indicate what speed (10, 100, or 1000 Mbps) the link has been established.

The following tables show the LED description and status.

Table A-1 LED Description and Status for 1000Base-SX

LED Description and Color	On (Steady)	Flashing	Off
Link - Green	Good connection between card and network at 1000 Mbps.	Port disabled by software, connection failed, or card trying to establish connection. Note: A6847A is not programmed to flash the Link LED.	No connection between card and network
ACT (Activity) - Amber	Data detected	Data detected	No data detected

Table A-2 LED Description and Status for 1000Base-T

LED Description and Color	On (Steady)	Flashing	Off
1000 - Green 100 - Green 10 - Green Note: Only one speed LED should be on at any given time.	Good connection between card and network at either 10, 100, or 1000 Mbps as indicated by LED. Note: For A4929A, if all Link speed LEDs are on steady, the driver is disabled or not installed.	N/A	No connection between card and network.
ACT (Activity) - Amber (Green on A6794A)	Data detected	Data detected	No data detected

Cabling Requirements

LAN card connectors adhere to appropriate standards and are widely available. The 1000Base-SX port is compatible with the IEEE 802.3z standard and uses a single duplex SC connector. The 1000Base-T port is compatible with the IEEE 802.3ab standard and uses an RJ-45 connector.

Incorrectly wired or installed cabling is the most common cause of communications problems for local area networks. HP recommends that you work with a qualified cable installer for assistance in your cabling requirements. The following tables summarize cabling requirements:

Table A-3 Cabling Requirements for 1000Base-SX

Description (850nm short-wave laser)	Modal Bandwidth	Operating Distance
62.5 micron MMF (multimode fibre)	160 (MHz * km)	2 to 220 meters
	200 (MHz * km)	2 to 275 meters
50 micron MMF (multimode fibre)	400 (MHz * km)	2 to 500 meters
	500 (MHz * km)	2 to 550 meters

Table A-4 Cabling Requirements for 1000Base-T

Description	Bandwidth	Operating Distance
Cat 5 or Cat 5E UTP	100 MHz	Up to 100 meters

Back-to-Back Connection

When running 1000Base-T back-to-back at either 10 or 100 Mbps, you must use a crossover cable configuration. At 1000 Mbps, you can use either a crossover or straight-through cable.

A6825A & A6847A Card Physical and Environmental Specifications

Physical

Dimensions: 6.6 in by 2.5 in

Electrical

Power requirement: +8 watts max

Environmental

Temperature
Degrees F = (1.8 x Degrees C) + 32

Operating Temperature:	0° C to 50° C
Storage Temperature:	-40° C to 60° C

Humidity

Operating Relative humidity range	5 to 95% non-condensing (40° C: 16 hour dwells at extremes)
Non-operating/storage humidity:	5 to 95% non-condensing 20° C/hour

Altitude

Operating:	10,000 ft. (3.1km)
Non-operating:	35,000 ft

Electromagnetic Compatibility

FCC Class A	USA
CISPR-22/EN55022 Class A	International and Europe
CISPR-24	Europe
VCCI Class A	Japan

FCC Statement (For U.S.A.)

Federal Communications Commission Radio Frequency Interference Statement

WARNING **This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:**
(1) This device may not cause harmful interference and
(2) this device must accept any interference received, including interference that might cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy, and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

Hewlett-Packard's system certification tests were conducted with HP-supported peripheral devices and cables, such as those received with your system. Changes or modifications to this equipment not expressly approved by Hewlett-Packard could void the user's authority to operate the equipment.

Canada

Warning: This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du règlement sur le matériel brouilleur du Canada.

EMI (Australia and New Zealand)

This product meets the applicable requirements of the Australia and New Zealand EMC Framework.

VCCI (Japan) (PCI Card Only)

This equipment complies with the Class A category for information technology equipment based on the rules of Voluntary Control Council for Interference by Information Technology Equipment. When used in a residential area, radio interference may be caused. In this case, the user may be required to take appropriate corrective actions.

Figure A-1 VCCI Regulatory Statement

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

EMI Statement (European Community)

NOTE This is a Class A product. In a domestic environment, this product may cause radio interference, in which case you may be required to take adequate measures.

Laser Safety Statements

Laser Safety Statements - U.S. FDA/CDRH - Optical (laser) Transceiver

CAUTION The optical transceiver provided on the network interface card contains a laser system and is classified as a "Class-I Laser Product" under a U.S. Department of Health and Human Services (DHHS) Radiation Performance standard according to the Radiation Control for Health and Safety Act of 1968. The Class I label and compliance statement are located on the optical transceiver.

To ensure proper use of this product, please read this instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location.

CAUTION Use of controls, adjustments or the performance procedures other than those specified herein may result in hazardous radiation exposure. To prevent direct exposure to laser beam, do not try to open the enclosure.

Laser Safety - European Union - Optical Transceiver Only

CAUTION The optical transceiver provided on the network interface card contains a laser system and is classified as a "Class 1 Laser Product" per EN 60825-1, Safety of Laser products. Class 1 laser products are considered safe and do not pose a biological hazard if used within the data sheet limits and instructions.

To ensure proper use of this product, please read this instruction manual carefully and retain for future reference. Should the unit ever require maintenance, contact an authorized service location.

CAUTION Use of controls, adjustments or the performance procedures other than those specified herein may result in hazardous radiation exposure. To prevent direct exposure to laser beam, do not try to open the enclosure.

There are no user serviceable parts nor any maintenance required for the optical transceiver. All adjustments are made at the factory before shipment to customers. Tampering with or any attempt to modify the optical transceiver will result in voided product warranty. It may also result in improper operation of the network card circuitry and possible overstress of the laser source. Device degradation or product failure may result.

A6825A & A6847A Declaration of Conformity

DECLARATION OF CONFORMITY
According to ISO/IEC Guide 22 and EN 45014

Manufacturer's Name: Hewlett-Packard Company
Systems Interconnect Solutions Lab

Manufacturer's Address: 8000 Foothills Blvd.
Roseville, CA 95747
USA

declares, that the product

Product Name: PCI 1000BT / PCI 1000SX

Model Number(s): A6825A and A6847A

Product Options: All

conforms to the following Product Specifications:

Safety: IEC 950:1991 + A1, A2, A3, A4 / EN 60950:1992 + A1, A2, A3, A4, A11
GB 4943-1995. IEC 825-1:1993/ EN60825-1:1994+A1, Class 1 Laser

EMC: CISPR 22:1997 / EN 55022:1998 - Class A
CNS 13438, GB 9254-1988, CFR47, Part 15 Class A
CISPR 24:1997 / EN 55024:1998
IEC 61000-4-2
IEC 61000-4-3 / ENV 50204
IEC 61000-4-4
IEC 61000-4-6

Supplementary Information:

The product herewith complies with the requirements of the EMC Directive 89/336/EEC and carries the CE marking accordingly.

1) The Product was tested in a typical configuration with Hewlett-Packard information technology equipment.

Tom Le, Hardware Engineer

Cupertino, CA, April, 2002

European Contact: Your local Hewlett-Packard Sales and Service Office or Hewlett-Packard GmbH, Department HQ-TRE, Herrenberger Straße 130, D-71034 Böblingen (FAX: + 49-7031-14-3143)